

CLAIM AMENDMENTS

Please cancel Claim 52, amend Claims 1-5, 7, 15-18, 23, 27, and 53, and insert new Claims 54 and 55 as follows.

1. (Currently Amended) An image pick-up apparatus comprising:

a plurality of photoelectric conversion elements and ~~switching elements~~ TFTs arranged on an insulating substrate, wherein the photoelectric conversion elements and TFTs comprise an amorphous silicon film formed on the insulating substrate, and surface areas of the photoelectric conversion elements are higher than peripheral areas of the photoelectric conversion elements thereby forming steps;

a wavelength converter positioned and configured to convert incident radiation to light having a wavelength detectable by said photoelectric conversion elements;

a protective layer arranged on ~~said~~ the insulating substrate so as to cover said photoelectric conversion elements and said ~~switching elements~~ TFTs, wherein the protective layer is formed from an inorganic material, a surface of the protective layer has surface steps corresponding to the photoelectric conversion element steps, and the protective layer is arranged in a wider area compared to the area where the photoelectric conversion elements and TFTs are arranged; and

~~an additional~~ a flattening layer ~~[[,]]~~ arranged on ~~a~~ the surface of the protective layer; wherein ~~a material of said~~ the additional flattening layer is formed from an organic material ~~different from that of said protection layer;~~

wherein the flattening layer is arranged in a wider area compared to the area where the wavelength converter is arranged;

wherein a thickness of the flattening layer is thicker than that of the protective layer;

wherein a surface of the ~~additional~~ flattening layer is flatter than the surface of the ~~protection~~ protective layer; and

wherein the wavelength converter comprises a columnar crystal scintillator deposited on ~~a flat~~ the surface of ~~said the additional~~ flattening layer.

2. (Currently Amended) An image pick-up apparatus according to Claim 1, wherein the ~~additional~~ flattening layer is obtained by flattening the protective layer provided on the insulating substrate.

3. (Currently Amended) An image pick-up apparatus according to Claim 1, wherein the ~~additional~~ flattening layer comprises a polyimide resin.

4. (Currently Amended) An image pick-up apparatus according to Claim 1, wherein ~~a second~~ an additional flattening layer is provided on the wavelength converter.

5. (Currently Amended) An image pick-up apparatus according to Claim 4, wherein the ~~second~~ additional flattening layer covers the end face of the wavelength converter.

6. (Original) An image pick-up apparatus according to Claim 1, wherein the surface of the wavelength converter is flattened.

7. (Currently Amended) An image pick-up apparatus according to Claim 4, wherein a light reflection film is provided on the ~~second~~ additional flattening layer.

8. (Previously Presented) An image pick-up apparatus according to Claim 6, wherein a light reflection film is provided on the wavelength converter.

9. - 10. (Cancelled)

11. (Previously Presented) An image pick-up apparatus according to Claim 1, wherein the scintillator comprises a CsI crystal.

12. (Original) An image pick-up apparatus according to Claim 7, wherein the light reflection film is made of an aluminum film.

13. (Original) An image pick-up apparatus according to Claim 8, wherein the light reflection film is made of an aluminum film.

14. (Original) An image pick-up apparatus according to Claim 8, having plural insulating substrates.

15. (Currently Amended) An image pick-up apparatus comprising:

comprising:

a plurality of insulating substrates arranged on a substrate;

a plurality of photoelectric conversion elements and ~~switching elements~~ TFTs, arranged on each of the insulating substrates, wherein the photoelectric conversion elements and TFTs comprise an amorphous silicon film formed on the insulating substrates, and surface areas of the photoelectric conversion elements are higher than peripheral areas of the photoelectric conversion elements thereby forming steps;

a wavelength converter configured and positioned to convert incident radiation to light having a wavelength detectable by the photoelectric conversion elements;

a protective layer arranged on the insulating substrates so as to cover the photoelectric conversion elements and the ~~switching elements~~ TFTs, wherein the protective layer is formed from an inorganic material, a surface of the protective layer has surface steps corresponding to the photoelectric conversion element steps, and the protective layer is arranged in a wider area compared to the area where the photoelectric conversion elements and TFTs are arranged; and

~~an additional~~ a flattening layer arranged on a surface of the protective layer, wherein ~~a material of the additional flattening layer is different from that of the photoelectric layer formed from an organic material,~~

wherein the flattening layer is arranged in a wider area compared to the area where the wavelength converter is arranged,

wherein a thickness of the flattening layer is thicker than that of the protective layer,

wherein a surface of the ~~additional~~ flattening layer is flatter than the surface of the protective layer, and

wherein the wavelength converter comprises a columnar crystal scintillator deposited on ~~a flat~~ a surface of the ~~additional~~ flattening layer.

16. (Currently Amended) An image pick-up apparatus according to Claim 15, wherein the ~~additional~~ flattening layer is obtained by flattening the protective layer provided on the insulating ~~substrate~~ substrates.

17. (Currently Amended) An image pick-up apparatus according to Claim 15, wherein the ~~additional~~ flattening layer comprises a polyimide resin.

18. (Currently Amended) An image pick-up apparatus according to Claim 15, wherein the ~~additional~~ flattening layer is arranged on the plurality of insulating substrates.

19-20. (Cancelled)

21. (Previously Presented) An image pick-up apparatus according to Claim 15, wherein the scintillator comprises a CsI crystal.

22. (Cancelled)

23. (Currently Amended) An image pick-up system comprising:
an image pick-up apparatus including: a plurality of photoelectric conversion elements and ~~switching elements~~ TFTs arranged on a an insulating substrate, wherein the photoelectric conversion elements and TFTs comprise an amorphous silicon film formed on the insulating substrate, and surface areas of the photoelectric conversion elements are higher than peripheral areas of the photoelectric conversion elements thereby forming

steps; a wavelength converter configured and positioned to convert incident radiation to light having a wavelength detectable by the photoelectric conversion elements; a protective layer arranged on the substrate so as to cover the photoelectric conversion elements and the switching elements TFTs, wherein the protective layer is formed from an inorganic material, a surface of the protective layer has surface steps corresponding to the photoelectric conversion element steps, and the protective layer is arranged in a wider area compared to the area where the photoelectric conversion elements and TFTs are arranged; and an additional a flattening layer on a surface of the protective layer;

wherein material of said additional flattening layer is different from that of the protective layer; formed from an organic material, wherein the flattening layer is arranged in a wider area compared to the area where the wavelength converter is arranged;

wherein a thickness of the flattening layer is thicker than that of the protective layer;

wherein a thickness of the flattening layer is thicker than that of the protective layer.

wherein a surface of the additional flattening layer is flatter than the surface of the protective layer, and

wherein the wavelength converter is comprises a columnar crystal scintillator deposited on a flat the surface of the additional flattening layer;

a signal processor configured to process the signal from the image pick-up apparatus; and

a display configured to display the processed signal from the signal processor.

24. (Previously Presented) An image pick-up system according to Claim 23, further comprising a telecommunication device configured to transfer the signal from the signal processor.

25. (Previously Presented) An image pick-up apparatus system to Claim 23, further comprising a recorder configured to record the signal from the signal processor.

26. (Previously Presented) An image pick-up system according to Claim 23, further comprising a storage device configured to store the signal from the signal processor.

27. (Currently Amended) An image pick-up system comprising:
a plurality of insulating substrates arranged on a substrate; a plurality of photoelectric conversion elements and ~~switching elements~~ TFTs, arranged on each of the insulating substrates wherein the photoelectric conversion elements and TFTs comprise an amorphous silicon film formed on the insulating substrates, and surface areas of the photoelectric conversion elements are higher than peripheral areas of the photoelectric conversion elements thereby forming steps; a wavelength converter configured and positioned to convert incident radiation to light having a wavelength detectable by the photoelectric conversion elements; a protective layer arranged on the insulating substrates so as to cover the plurality of photoelectric conversion elements and ~~switching elements~~ TFTs, wherein the protective layer is formed from an inorganic material, a surface of the protective layer has surface steps corresponding to the photoelectric conversion element steps, and the protective layer is arranged in a wider area compared to the area where the

photoelectric conversion elements and TFTs are arranged; and an additional flattening layer arranged on a surface of the protective layer;

wherein material of said additional flattening layer is different from that of the protective layer, formed from an organic material,

wherein the flattening layer is arranged in a wider area compared to the area where the wavelength converter is arranged;

wherein a thickness of the flattening layer is thicker than that of the protective layer,

wherein a surface of the additional flattening layer is flatter from the surface of the protective layer, and

wherein the wavelength converter comprises a columnar crystal scintillator deposited on a flat the surface of the additional flattening layer;

a signal processor configured to process the signal from the image pick-up apparatus; and

a display configured to display the processed signal from the signal processing means.

28. (Previously Presented) An image pick-up system according to Claim 27, further comprising a recorder configured to record the processed signal from the signal processor.

29. (Previously Presented) An image pick-up system according to Claim 27, further comprising a telecommunication device configured to transfer the signal from the signal processor.

30. (Previously Presented) An image pick-up system according to Claim 27, further comprising a storage device configured to store the signal from the signal processor.

31.-52. (Canceled)

53. (Currently Amended) The image pick-up apparatus according to Claim ~~52~~1, wherein the photoelectric conversion elements comprise an amorphous silicon film.

54. (New) An image pick-up apparatus according to Claim 1, wherein the protective layer comprises SiN.

55. (New) An image pick-up apparatus according to Claim 15, wherein the protective layer comprises SiN.